



Australian Bureau of Statistics

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Feature Article - Expanding the use of indicators of sampling error in ABS economic statistics publications

BACKGROUND

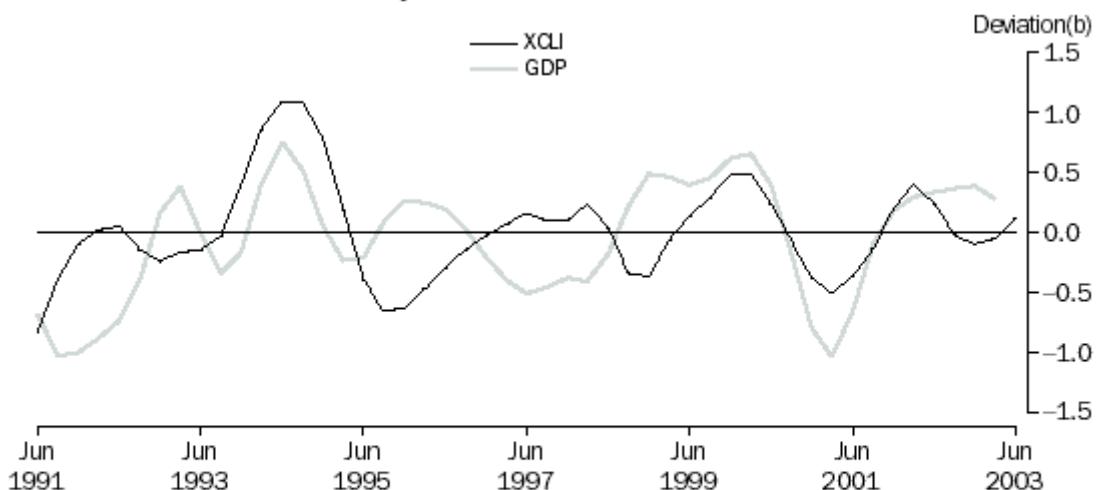
The ABS Experimental Composite Leading Indicator (XCLI) is a time series designed to provide early signals of turning points in the Australian business cycle. It does not predict the level of GDP or signal recessions or recoveries.

The XCLI has been developed to supplement rather than to compete with existing forms of economic analysis and forecasting. It has been published each quarter in **Australian Economic Indicators** (in the March, June, September and December issues).

RECENT PERFORMANCE

Past performance of the XCLI shows it led turning points in the business cycle by between one and six quarters, with the average being around two quarters. However the XCLI has not been performing well recently, with the lead time between movements in the XCLI, and the GDP business cycle steadily declining. The ABS has decided to cease production of the XCLI after this quarter. (See page 1 for more details).

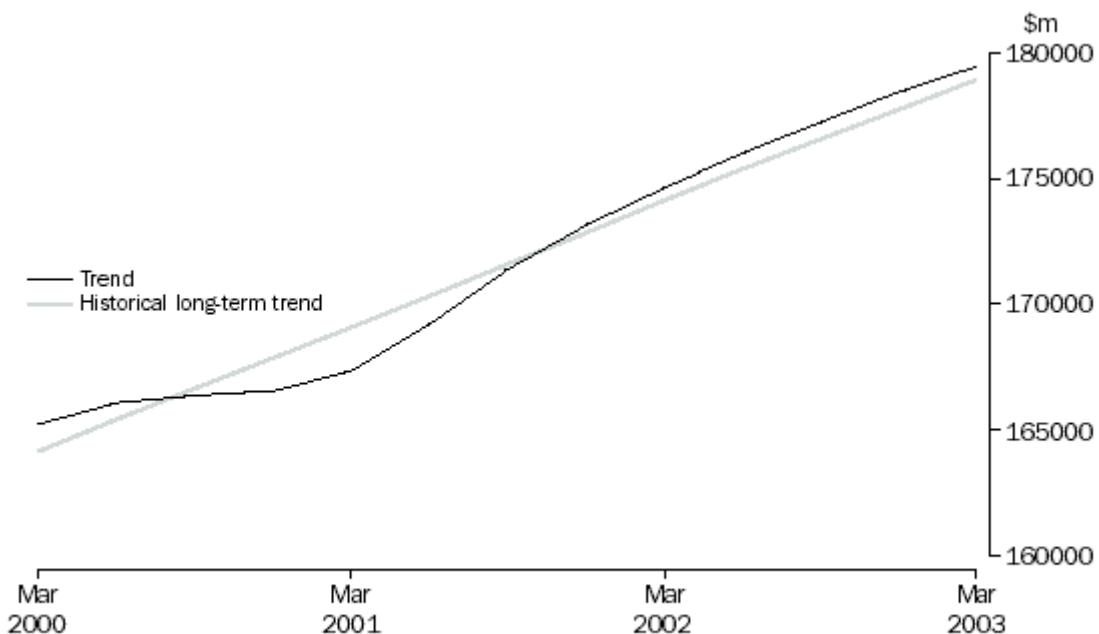
1. EXPERIMENTAL COMPOSITE LEADING INDICATOR (XCLI) AND ITS TARGET, THE BUSINESS CYCLE IN GDP- Chain volume measure (reference year 2000-2001)(a)



(a) In the March quarter 2003, the historical long-term trend growth rate of GDP is 0.67% and the trend growth rate is 0.56%.

(b) Deviation is the unit of measure for the GDP series and it refers to the deviation of trend from its historical long-term trend. The XCLI series has no official unit of measure, ie it is dimensionless. (see Endnote).

2. GDP, Chain volume measure (reference year 2000-2001)



Source: ABS (Cat. no. 5206.0), Quarterly data

MOST RECENT MOVEMENTS

In the June quarter 2003, the XCLI rose for the second quarter following three quarters of decline (up 0.17 to 0.12). The XCLI showed a provisional turning point at December quarter 2002. Based on historical performance a trough in the GDP business cycle may be expected to emerge several quarters later. The XCLI showed a peak in the March quarter 2002 and the GDP Business cycle showed a provisional peak in December quarter 2002.

The XCLI is signalling forthcoming growth in the GDP business cycle. Four of eight component indicators are making positive contributions. In the June quarter 2003, the series that gave the largest positive contribution was the Real Interest Rate series (0.13) while the largest negative contribution to the change in the XCLI came from the Trade Factor (-0.09).

The growth in GDP trend slowed continually from the December quarter 1999 (when it grew by 1.1%) to the December quarter 2000 (0.1%). This was followed by GDP growth for three consecutive quarters at an increasing rate, reaching growth of 1.3% in the September quarter 2001. Since then the quarterly growth rate has slowed continually, with growth of 0.6% in the March quarter 2003. The growth of the historical long-term trend was 0.7% in the March quarter 2003. This rate of growth has been slowing since the peak of 1.2% in December quarter 1997.

TABLE 1 XCLI AND GDP CHAIN VOLUME MEASURE (REFERENCE YEAR 2000-2001)

	Mar 2002	Jun 2002	Sep 2002	Dec 2002	Mar 2003	Jun 2003
LEVEL						
XCLI	0.20	0.41	0.24	-0.01	-0.07	-0.04
GDP Trend (\$m)	173,284	174,912	176,320	177,647	178,846	na
GDP Long-term trend (\$m)	173,017	174,296	175,547	176,722	177,831	na
GDP Business cycle	0.15	0.35	0.44	0.52	0.57	na

MOVEMENT FROM PREVIOUS QUARTER						
XCLI (change)	0.33	0.21	-0.17	-0.26	-0.06	0.03
GDP Trend (% change)	1.08	0.94	0.80	0.75	0.67	na
GDP Long-term trend (% change)	0.75	0.74	0.72	0.67	0.63	na
GDP Business cycle (change)	0.33	0.20	0.09	0.08	0.05	na

TABLE 2 CONTRIBUTIONS TO QUARTERLY CHANGES IN THE XCLI

	Mar 2002	Jun 2002	Sep 2002	Dec 2002	Mar 2003	Jun 2003
Trade factor	0.04	0.09	0.03	-0.03	0.02	-0.02
United States GDP	0.01	0.07	0.08	0.05	0.03	0.01
Housing Finance Commitments	-0.01	0.05	-0.03	-0.01	-0.01	-0.01
Job Vacancies	-0.01	0.06	0.08	0.08	0.08	0.09
S&P/ASX 200 Industrials index	0.01	0.05	-0.08	-0.12	-0.06	-0.07
Real interest rate (inverse lagged four quarters)	0.17	-0.14	-0.36	-0.27	-0.08	0.10
Production expectations (lagged one quarter)	0.09	0.11	0.07	0.02	0.01	0.00
Business expectations (lagged one quarter)	0.03	0.02	0.03	0.02	-0.05	-0.08
Total XCLI, change from previous quarter	0.33	0.21	-0.17	-0.26	-0.06	0.03

THE REFERENCE SERIES, GDP

The reference or target series for the XCLI is the GDP business cycle in Australia. The business cycle of a series is defined as the deviation between the trend and the historical long-term trend in the series. Graph 1 shows the business cycles in GDP and the XCLI. Graph 2 shows the level of trend GDP compared with its historical long-term trend. When the trend is above the historical long term trend the GDP business cycle shown in Graph 1 is positive.

TURNING POINTS THE XCLI HAS HAD TROUBLE PREDICTING

In the December quarter 1995, there was a peak in the business cycle which the XCLI failed to predict. This peak was largely attributable to the effects of a good farm season. The current drought is expected to have the opposite effect by depressing GDP growth. The XCLI does not contain an indicator which leads first order farm product effects. In recognition of this, Graph 3 presents an alternative target series, namely, the business cycle of non-farm GDP, chain volume measure.

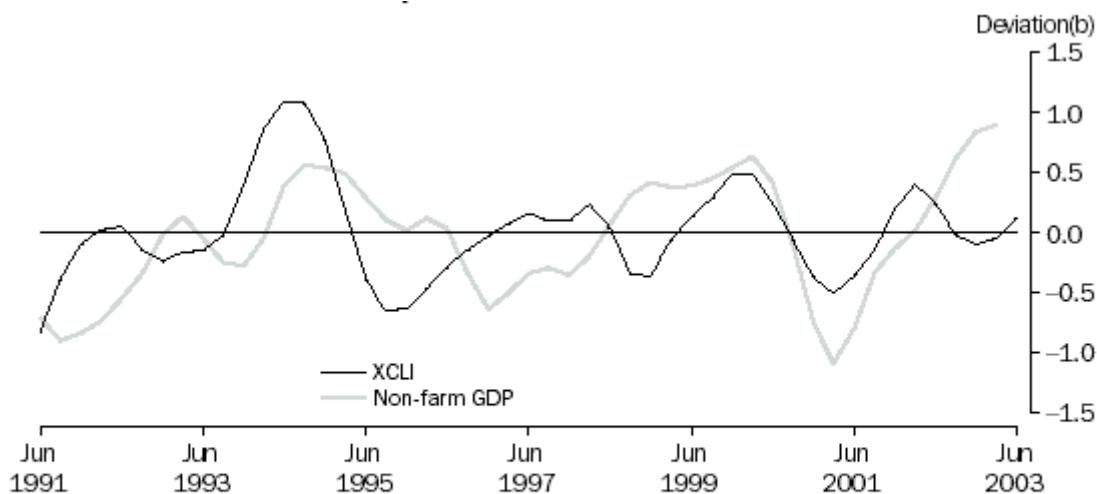
The XCLI showed a provisional trough in the December quarter 2002. Based on historical performance, the non-farm GDP business cycle may have been expected to trough two quarters later. However, the non-farm GDP business cycle has still not peaked but its growth has slowed. This suggests that a subsequent trough may be some quarters away.

The XCLI has been experiencing a decline in the lead time of predicting turning points in the GDP business cycle. The past four turning points in the business cycle have been predicted by the XCLI but the lead time has been decreasing.

3. EXPERIMENTAL COMPOSITE LEADING INDICATOR (XCLI) AND, THE BUSINESS CYCLE

IN NON-FARM GDP

Chain volume measure (reference year 2000-2001)(a)



(a) In the December quarter 2002, the historical long-term trend growth rate of non-farm GDP is 0.67% while the trend growth rate is 1.1%.

(b) Deviation is the unit of measure for the GDP series and it refers to the deviation of trend from its historical long-term trend. The XCLI series has no official unit of measure, ie it is dimensionless (see Endnote).

ANALYSIS OF COMPONENT INDICATORS

The XCLI summarises the business cycles present in a selection of economic indicators which had typically shown turning points ahead of the business cycle in GDP from the early 1970s to the early 1990s. Because the evolution of each expansion and contraction in activity presents a unique combination of features, none of the individual component indicators has had an unvarying or perfectly stable leading relationship with GDP. However, when combined to form the XCLI their performance as a group is more stable.

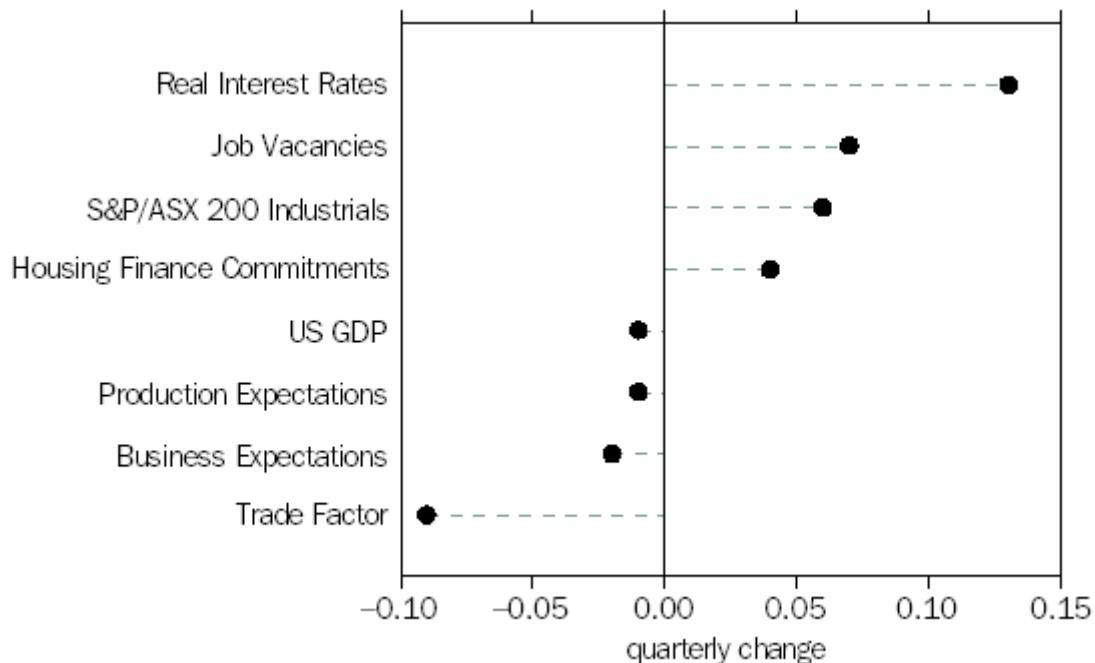
In the June quarter 2003, four of the eight components made positive contributions to the quarterly change in the XCLI, two made negative contributions and two made negligible contributions (Table 2 and Graph 4). This has caused the XCLI to grow from the previous quarter. Graphs 5 to 12 show each component's trend and historical long-term trend.

Positive contributions. The components making significant positive contributions to the quarterly change in the June quarter 2003 XCLI were real interest rates (0.13, Graph 10), job vacancies (0.07, Graph 8), S&P/ASX 200 Industrials index (0.06, Graph 9) and housing finance commitments (0.04, Graph 7).

Negative contributions. The components making negative contributions to the quarterly change in the June quarter 2003 XCLI were trade factor (-0.09, Graph 5) and business expectations (-0.02, Graph 12).

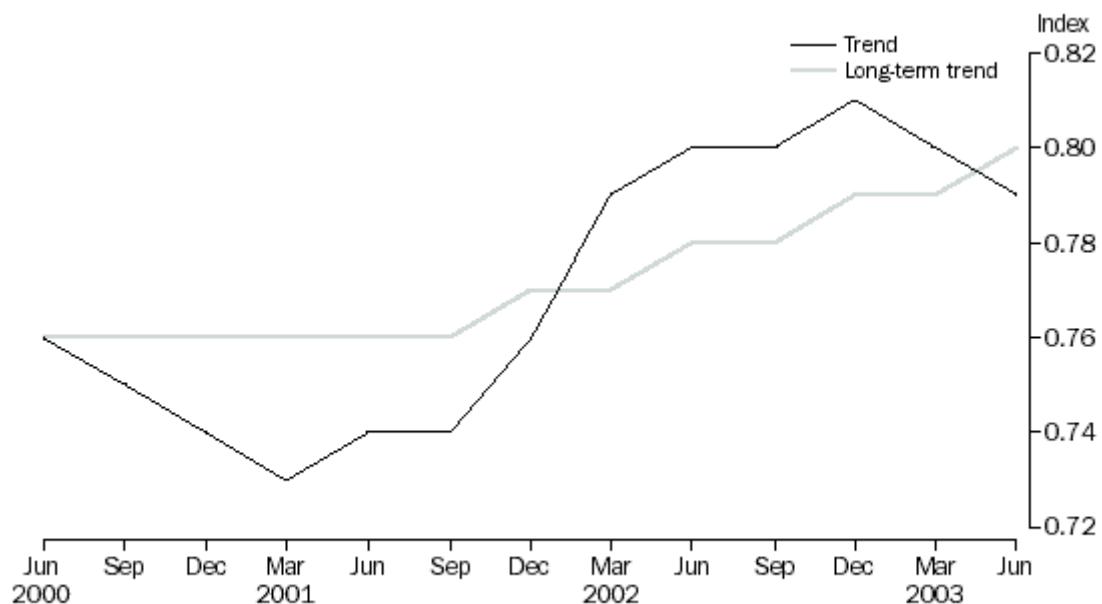
Negligible contributions. The components making negligible contributions to the quarterly change in the June quarter 2003 XCLI were US GDP (-0.01, Graph 6) and production expectations (-0.01, Graph 11).

4. CONTRIBUTIONS TO QUARTERLY CHANGES IN THE XCLI



Trade Factor

5. TRADE FACTOR

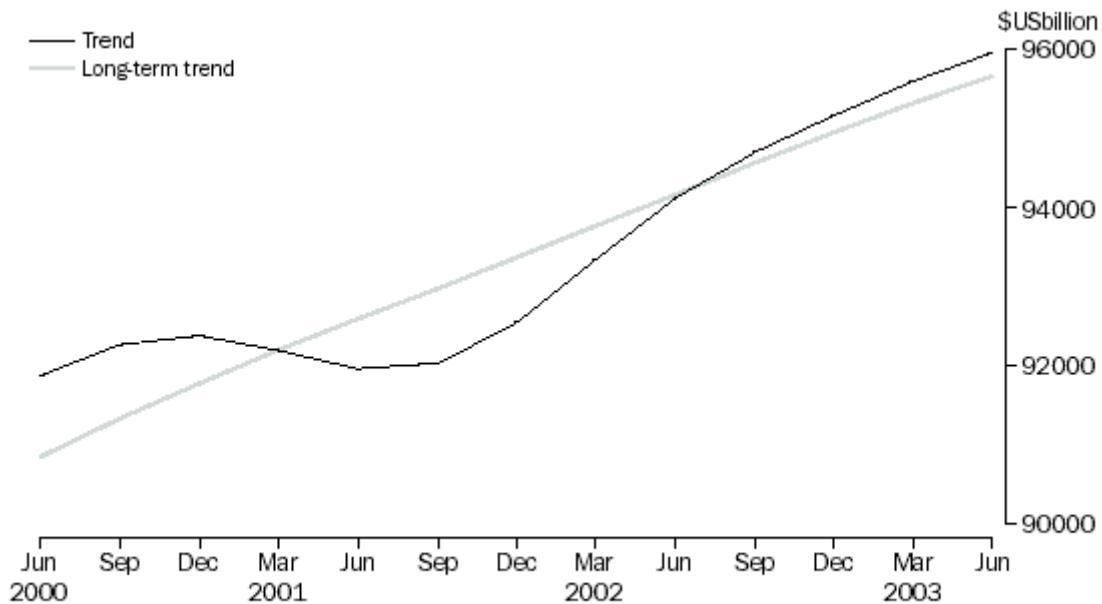


Source: ABS (Cat. no. 6411.0) and RBA Bulletin.

The trade factor is defined as the ratio between commodity prices in terms of Special Drawing Rights and the price index for imported materials used by Australian producers. This ratio gives an early indication of changes in the terms of trade. The trend of the trade factor fell in the June quarter 2003, following a fall in the March quarter 2003. The long-term trend rose in the June quarter 2003 and as a result the trade factor component made a negative contribution (-0.09) to the change in the XCLI.

United States GDP

6. UNITED STATES GDP, Chain volume measure (Reference year 1996)

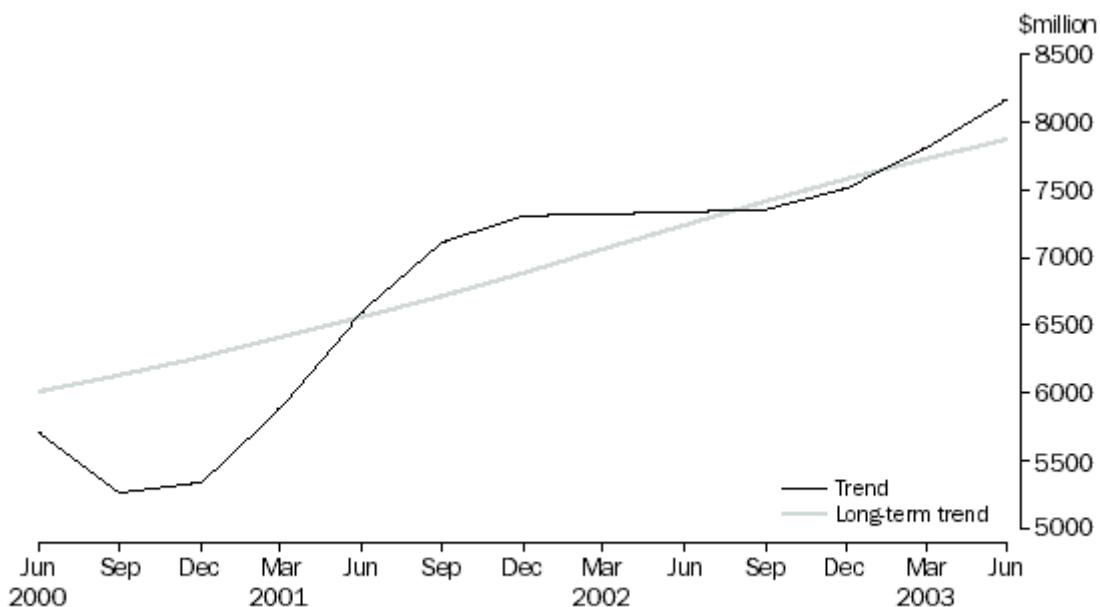


Source: US Bureau of Economic Analysis.

The US GDP component made a negligible contribution (-0.01) to the change in the XCLI in the June quarter 2003 as the trend and the long term trend are moving very similarly. This is the seventh quarter of positive or negligible contributions for this component. The trend of the United States GDP grew in the June quarter 2003 for the eighth consecutive quarter. The rate of growth of the long-term trend has decelerated since the March quarter 1998. The trend of the US GDP rose above its long-term trend in the June quarter 2002 after falling below it in the March quarter 2001.

Secured housing finance commitments

7. SECURED HOUSING FINANCE COMMITMENTS



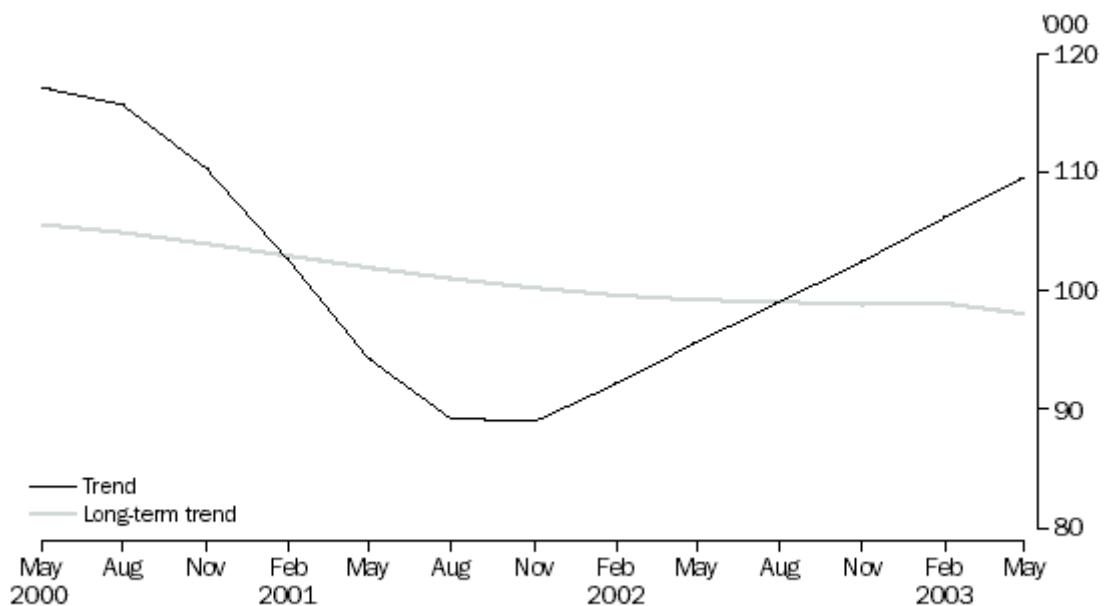
Source: ABS (Cat. no. 5671.0).

The trend of the secured housing finance commitments rose in the June quarter 2003 making eleven quarters of growth. The historical long-term trend for secured housing finance commitments has risen since the September quarter 1995 although its rate of growth has been declining since the March quarter 2002.

The secured housing finance commitments component contributed positively (0.04) to the change in the XCLI in the June quarter 2003. This is because the trend rose faster than the long term trend in the June quarter.

Job Vacancies

8. JOB VACANCIES



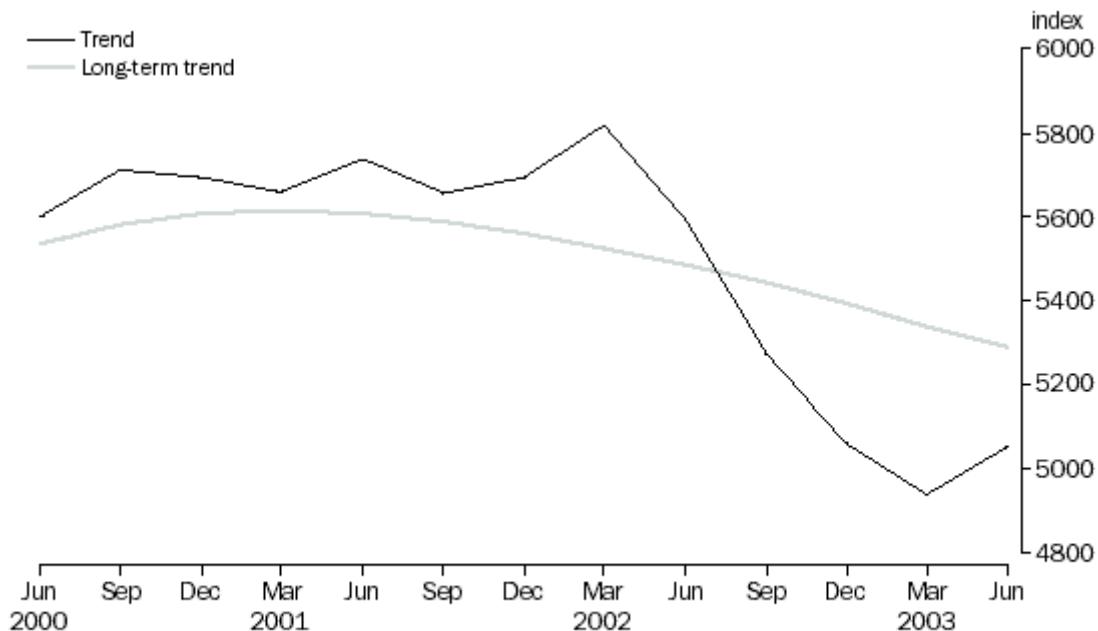
Source: ABS (Cat. no. 6354.0).

Note that the job vacancies series are referenced to the middle month of a quarter.

The job vacancies trend rose in May 2003 (3.2%). This is the sixth quarterly rise in this series following six quarters of decline. The long-term trend fell in May 2003 (-0.9%) following a slight rise in February 2003 (0.1%). Prior to this the series had been falling since May 2000. The combination of growth in trend and fall in the long-term trend vacancies made a positive contribution (0.7) to the change in the XCLI in the June quarter 2003. This is the sixth quarter of positive contributions to the XCLI.

S&P/ASX 200 Industrials index

9. S&P/ASX 200 INDUSTRIALS INDEX



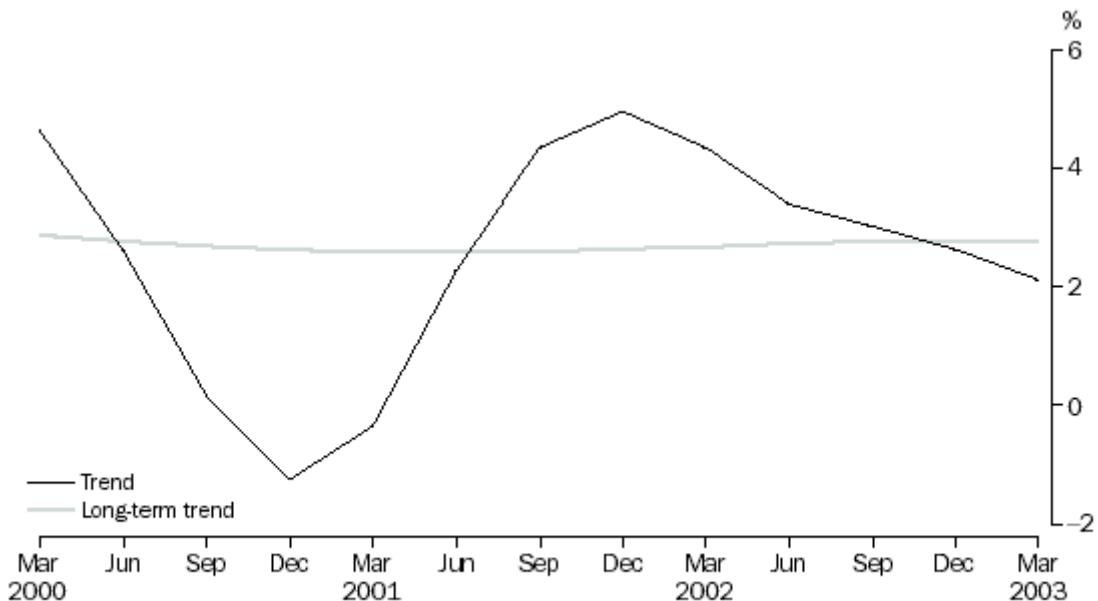
Source: Australian Stock Exchange.

In the June quarter 2003, the trend of the S&P/ASX 200 Industrials Index rose (2.3%) following four quarters of falls. The long-term trend fell (- 0.9%). The growth rate of the long-term trend began to slow in June quarter 1997 and the trend began to fall in September 2001.

As the trend series rose and the long-term trend fell, the S&P/ASX 200 Industrials Index made a positive contribution (0.06) to the change in the XCLI in the June quarter 2003. This follows four quarters of negative contributions to the XCLI.

Real Interest Rate

10. REAL INTEREST RATE



Source: ABS (Cat. no. 5206.0) and Treasury.

Note: The real interest rate is defined as the difference between nominal interest rates and the change in the domestic final demand chain price index.

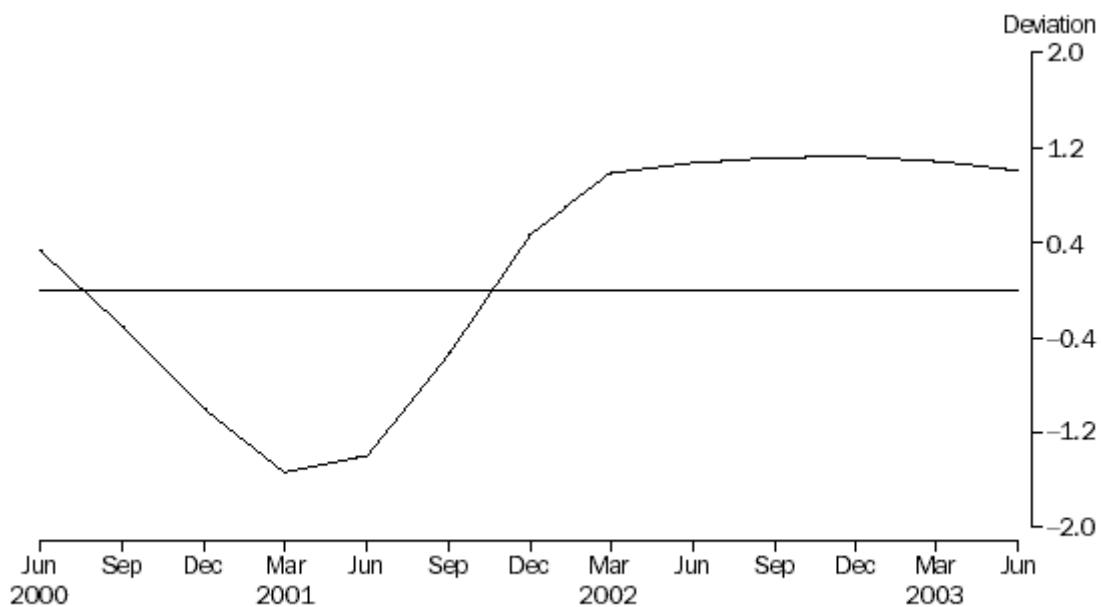
The XCLI uses the inverse of the business cycle in the real interest rate, lagged four quarters. Therefore, it is the June quarter 2002 movement of the real interest rate that contributes to the June quarter 2003 movement in the XCLI. The real interest rate component made a positive contribution (0.13) to the change in the XCLI in the June quarter 2003.

The trend of the real interest rate fell in the March quarter 2003. This followed four quarters of falls and four quarters of rises in the series. The long-term trend also fell following six quarters of slight rises.

It is the relative movements in the trend and long-term trend series in the June quarter 2002 that contribute to the June 2003 XCLI. The movements in the September quarter 2002 mean the real interest rate component would have been expected to make a positive contribution to the change in the September quarter 2003 XCLI.

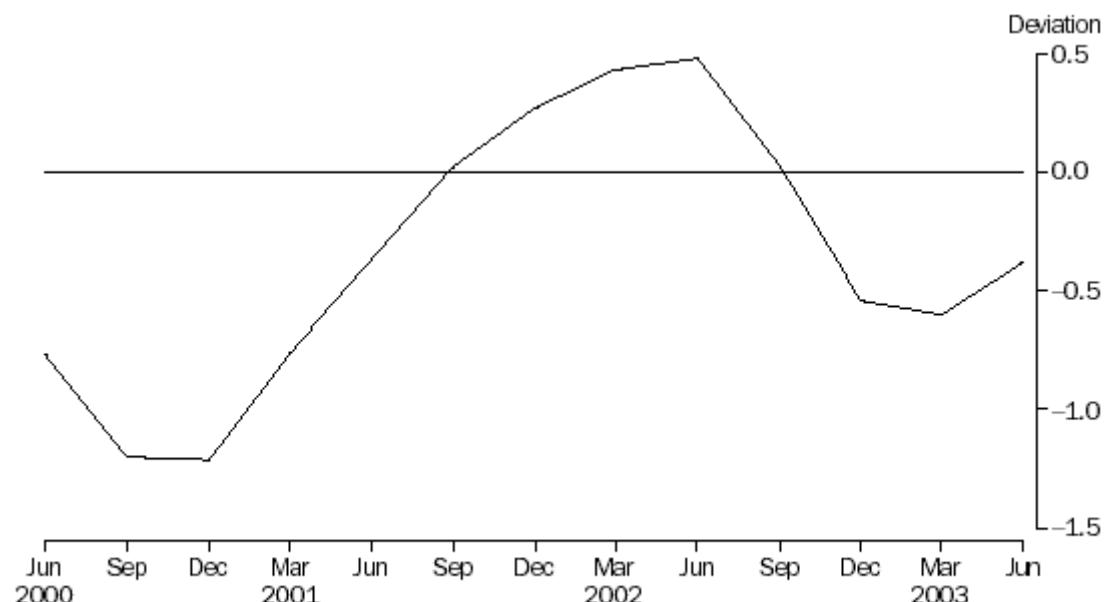
Production and business expectations

11. PRODUCTION EXPECTATIONS, Trend



Source: ACCI and Westpac Banking Corporation, 'Survey of Industrial Trends'.

12. BUSINESS EXPECTATIONS, Trend



Source: ACCI and Westpac Banking Corporation, 'Survey of Industrial Trends'.

Note: These components are lagged one quarter in the compilation of the XCLI. Like other XCLI components, the production expectations and business expectations series have been smoothed and standardised to display cyclical behaviour. However, these series are not considered to exhibit long-term trend growth.

In the June quarter 2003, the trend of production expectations showed a decrease. According to the Survey of Industrial Trends (produced by ACCI and Westpac Banking Corporation), production expectations in original terms were down in March quarter 2002. Because this component is lagged one quarter, it was the small negative movement in the March quarter 2002 that made a small negative contribution in the change in the XCLI in the June quarter 2003 (-0.01). This component would have been expected to make a negative contribution for the September quarter 2003.

In the June quarter 2003, the trend of business expectations rose following falls in the previous three quarters. According to the June quarter 2003 Survey of Industrial Trends business expectations have rebounded sharply following the slump induced by external geo-political factors in the previous quarter. Because this component is lagged, it was the decrease in business expectations in the March quarter 2003 that made a negative contribution to the change in the XCLI in the June quarter 2003 (-0.02). This component would have been expected to make a positive contribution for the September quarter 2003.

Note: The source of these expectations series is the Australian Chamber of Commerce and Industry, and Westpac Banking Corporation, Survey of Industrial Trends.

LONGER TIME SERIES AND FURTHER DETAILS

Details of the compilation of the XCLI index can be found in **An Experimental Composite Leading Indicator of Australian Economic Activity**, (ABS Cat. no. 1347.0), released in June 1993, and in the feature articles published in **Australian Economic Indicators** (ABS Cat. no. 1350.0) in August and October 1992 and May 1993.

Longer time series of the data presented in this XCLI article are available on AUSSTATS. For further information about these statistics please contact Jo Jackson on Canberra (02) 6252 6114.

ENDNOTE

The unit of measurement varies between XCLI components. For example, the real interest rate is measured as a percentage, job vacancies as a number, United States GDP in dollar terms and the trade factor is measured in index number form. Each component is therefore standardised to make its contribution to the XCLI comparable.

The standardisation procedure gives each XCLI component an average value of 1. The variation of each component about its average is also standardised, so that the average deviation also equals 1. Chain volume GDP (the reference series) is also standardised in the same way.

Graphs 1 and 3 use the standardised forms of the XCLI, GDP and non-farm GDP series. The graphs show the deviation of the standardised series from their respective historical long-term trends. Because of the standardisation procedure, the deviation measure has no particular unit (i.e. it is not measured in dollars, or percentage change, or any other real world unit).

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